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# Transfer of Four Species of *Scabiosa* to *Lomelosia* (Dipsacaceae)

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**ABSTRACT.** Four species of *Scabiosa* L. are transferred to *Lomelosia* Raf. (Dipsacaceae) to complete the relocation of all scabious taxa with a pitted epicalyx into *Lomelosia*. The new combinations are: *L. deserticola* (Rech. f.) P. Caputo & Del Guacchio, *L. poecilocarpa* (Rech. f.) P. Caputo & Del Guacchio, *L. schimperiana* (Boiss. & Buhse) P. Caputo & Del Guacchio, and *L. transcaspica* (Rech. f.) P. Caputo & Del Guacchio.

**Key words:** Dipsacaceae, *Lomelosia*, *Scabiosa*.

*Scabiosa* L., according to its original concept (Linnaeus, 1753), was a broadly comprehensive genus. It included all taxonomic entities later placed in Dipsacaceae by Jussieu (1789) with flat or round, many-flowered capitula. The other two dipsacaceous genera recognized by Linnaeus, i.e., *Dipsacus* L. and *Knautia* L., respectively, included the more or less prickly entities with cylindrical capitula and one single pauci-flowered species (*K. orientalis* L.), which resembled *Lychnis* L. in its gross floral morphology. Later, *Scabiosa* sensu Linnaeus underwent various vicissitudes, mainly restricting its circumscription; taxa were segregated into different genera, and *Scabiosa* was subdivided into infrageneric taxa. Some of these names contributed to distinguish *Scabiosa* from far removed forms. For example, Adanson (1763) segregated the taxa with multiplied, plumose calyx awns into *Pterocephalus* Adans.; Haller (1768) segregated *Succisa* Haller, which has a praemorse rhizome and a 5-lobed epicalyx, while Roemer and Schultes, in their *Systema Vegetabilium* (1818), distinguished *Cephalaria* Schrad. ex Roem. & Schult. for its multiseriate involucral bracts and awned epicalyx. Additionally, Coulter (1824) gave a much wider circumscription for *Knautia*, and Beck (1893) separated *Succisella* Beck mainly on the basis of its urceolate epicalyx and lack of calyx awns.

Around the same time, various scholars, such as Coulter (1824) and Höck (1891), presented a much more restricted circumscription of the genus *Scabiosa* (including only taxa with an epicalyx distally expanded into a more or less membranous rim or corona), segregating *Trochocephalus* (Mert. & W. D. J. Koch) Opiz (≡ *Scabiosa* sect. *Trochocephalus* Mert.

& W. D. J. Koch, ≡ subgenus *Astrocephalus* (Coul.) Lack & Rech. f.), *Cyrtostemma* (Mert. & W. D. J. Koch) Spach (≡ *Scabiosa* sect. *Cyrtostemma* Mert. & W. D. J. Koch), *Sclerostemma* Schott ex Roem. & Schult. (= *Scabiosa* sect. *Sclerostemma* Mert. & W. D. J. Koch), and *Spongostemma* (Rchb.) Rchb. (≡ *Scabiosa* subg. *Spongostemma* Rchb.). By the 20th century, the taxonomic concept of *Scabiosa* included only those forms with more or less radiant capitula, a 5-awned calyx, and an epicalyx with a membranous corona (Ehrendorfer, 1964; Moore, 1976). *Scabiosa* sect. *Trochocephalus* includes taxa with eight pits at the apex of the epicalyx tube; *Scabiosa* sect. *Cyrtostemma* includes taxa with what were interpreted at the time as eight membranous openings (fenestrae) in an otherwise sclerified corona (Mayer and Ehrendorfer [1999] demonstrated that fenestrae are part of the epicalyx tube, not of the corona); and *Scabiosa* sect. *Scabiosa* includes taxa without pits or fenestrae.

After the studies of Verláque (1984, 1985, 1986a, 1986b) and Devesa (1984), which demonstrated independent evolutionary histories for the various sections of *Scabiosa*, Greuter and Raus (1985) designated *Lomelosia* Raf. (with priority over *Trochocephalus*) for the species traditionally belonging to *Scabiosa* sect. *Trochocephalus* and selected *Sixalix* Raf. for those species belonging to *Scabiosa* sect. *Cyrtostemma*. However, their work concerned only circum-mediterranean species.

The generic name *Pseudoscabiosa* Devesa (a replacement name for *Scabiosa* sect. *Astrothrix* Font Quer) was subsequently used (Greuter et al., 1986) for four archaic species traditionally either placed within *Scabiosa* sect. *Trochocephalus* or isolated in section *Astrothrix*. One of these species was later segregated by López González (1987) as a new genus *Pterocephalidium* G. López as *P. diandrum* (Lag.) G. López. Later, Soják (1987) transferred several *Scabiosa* taxa from Asia to *Lomelosia*. Finally, Rechinger (1989) and Lack and Rechinger (1991), while describing new species from Iran and adjacent Southwest Asia, did not adopt the nomenclatural changes proposed in Greuter and Raus (1985), and raised *Scabiosa* sect. *Astrocephalus* to subgeneric

status. Moreover, Rechinger (1989) created *Scabiosa* sect. *Olivieriana* Rech. f. to accommodate some annual members of *Scabiosa* subg. *Astrocephalus* with few-flowered capitula (this section was confirmed as monophyletic in a morphological investigation on species of *Lomelosia* by Castro & Caputo, 1999). Finally, on the basis of fruit differentiation and pollen, Mayer and Ehrendorfer (1999) demonstrated quite convincingly that *Lomelosia* is rather distant from the remaining members of *Scabiosa*, whereas *Scabiosa* s. str. and *Sixalix* are sister groups and so close that they hardly deserve separate generic status. Therefore, they proposed to merge *Sixalix* again within *Scabiosa* sect. *Cyrtostemma*. The distance of *Lomelosia* from the other scabious Dipsacaceae, as well as the sister group relationship between *Sixalix* and *Scabiosa*, were confirmed on molecular grounds by Caputo et al. (2004) and Avino et al. (2009), based on four DNA regions from the chloroplast and nucleus. Therefore, *Scabiosa* now encompasses only the eight species located in *Scabiosa* sect. *Cyrtostemma* and ca. 30 in section *Scabiosa* (= *Scabiosa* sect. *Sclerostemma*).

Accordingly, the transfer to *Lomelosia* is here proposed for three scabious taxa described by Rechinger (1989) and Lack and Rechinger (1991) in *Scabiosa* subg. *Astrocephalus*, i.e., *S. deserticola* Rech. f., *S. poecilocarpa* Rech. f., *S. transcaspica* Rech. f., as well as for another eastern *Scabiosa* species present in Iran, *S. schimperiana* Boiss. & Buhse. These four taxa show eight pits at the summit of the epicalyx tube, as indicated by Lack and Rechinger in both the descriptions and illustrations of all four taxa (Lack & Rechinger, 1991); this is a synapomorphic condition for *Lomelosia* (Caputo & Cozzolino, 1994) as well. Such transfer should complete the relocation of all known *Astrocephalus* taxa into *Lomelosia*.

It may be interesting to note alternate taxonomic placements for the transferred names. Jamzad (1993), who keeps a traditional and broad concept of genus *Scabiosa*, regarded *S. deserticola* as a synonym of *S. olivieri* Coul., *S. poecilocarpa* as a synonym of *S. persica* Boiss. var. *rosea* Jamzad, and *S. transcaspica* as a synonym of *S. flava* Boiss. & Hausskn. On the other hand, Czerepanov (1995) accepted independent species rank for *S. deserticola* and *S. transcaspica*. However, we would like to note that taxonomic concepts employed in dipsacaceous taxa can be quite narrow, as testified by the fragmentation of *Scabiosa* and *Pterocephalus* (López González, 1987; Mayer & Ehrendorfer, 2000), and species, especially within the *Scabiosa* group, often rest on small differences (e.g., within the *S. columbaria* L. group).

***Lomelosia deserticola* (Rech. f.) P. Caputo & Del Guacchio, comb. nov.** Basionym: *Scabiosa deserticola* Rech. f., Willdenowia 19(1): 142. 1989. TYPE: “Iraq, Desertum occidentale (Western Desert): in arenosis 2 km E Rutba versus Ramadi, 28.5.1957,” K. H. Rechinger 12806 (holotype, W not seen).

*Habitat and distribution.* *Lomelosia deserticola* is found in the deserts of Syria, Jordan, Iraq, Iran, Turkmenistan, Afghanistan, and Pakistan. A detailed distribution, list of specimens, and photographs are provided by Rechinger (1989) and Lack and Rechinger (1991).

*Specimen examined.* IRAQ. Desertum occidentale (Western desert), inter Ramadi et Rutba, 40 km a Ramadi occidentem versus, 6–7 June 1957, Rechinger 9817 (B [photo]).

***Lomelosia poecilocarpa* (Rech. f.) P. Caputo & Del Guacchio, comb. nov.** Basionym: *Scabiosa poecilocarpa* Rech. f., Fl. Iranica [Rechinger], 168: 50. 1991. TYPE: “Persia. Bakht.: Inter Dashtak et Cherry 13.VI.1973,” M. Iranshahr & M. Moussavi 15657-E (holotype, W-photo!; isotype, Herbarium of Evin, Tehran, Iran, not seen).

*Habitat and distribution.* *Lomelia poecilocarpa* is found in dry, open mountain habitats of Chaharmahal and Bakhtiari Province (southwestern Iran), where it is endemic.

*Specimen examined.* See above under *Lomelosia deserticola*. Photograph in Lack and Rechinger (1991: tab. 45).

***Lomelosia schimperiana* (Boiss. & Buhse) P. Caputo & Del Guacchio, comb. nov.** Basionym: *Scabiosa schimperiana* Boiss. & Buhse, Nouv. Mém. Soc. Imp. Naturalistes Moscou 12: 112–113. 1860. TYPE: “Persia. 1847, Buhse s.n.” (lectotype, designated by Rechinger in Lack & Rechinger [1991: 48], G-BOIS, G00330078-photo!).

The original label reports the name “*Scabiosa Schimperiana* Boiss. et Buhse” as well as the unpublished “*Scabiosa Buhseana* Boiss.” The specimen was relabeled by K. H. Rechinger in 1988, who added the locality “Gilan: Rudbar” and the indication “holotypus.” Note that in Lack and Rechinger (1991), the treatment of this species (and of all the annual *Scabiosa* species) is authored by Rechinger alone.

*Habitat and distribution.* *Lomelosia schimperiana* is found in open environments of Gilan Province

(northwestern Iran), where it is endemic. A distribution, list of specimens, and photograph are provided by Lack and Rechinger (1991).

*Specimen examined.* See above under *Lomelosia deserticola*. Photograph in Lack and Rechinger (1991: tab. 43).

**Lomelosia transcaspica** (Rech. f.) P. Caputo & Del Guacchio, comb. nov. Basionym: *Scabiosa transcaspica* Rech. f., Willdenowia 19(1): 148. 1989. TYPE: Turkmenistan. "USSR, Turcomania, Kizyl Arvat, Karakala, in monte Sundsodagh, 16.5.1891," P. Sintenis 1694-a (holotype, W photo; isotype, B, WU not seen).

*Habitat and distribution.* *Lomelosia transcaspica* is found in the mountains of Turkmenistan, Azerbaijan (including Nakhchivan), and the Caucasus region. A distribution, list of specimens, and photographs are provided in Rechinger (1989) and Lack and Rechinger (1991).

*Specimen examined.* See above under *Lomelosia deserticola*. Photograph in Lack and Rechinger (1991: tab. 53).

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